WHAT IS CLAIMED IS:

1. A semiconductor element comprising:

a semiconductor substrate of a first conductivity type having a first major surface and a second major surface opposing the first major surface;

a drift layer of the first conductivity type formed on the first major surface of said semiconductor substrate;

a well layer of a second conductivity type selectively formed in a surface of said drift layer;

a source layer of the first conductivity type selectively formed in a surface of said well layer;

a trench formed to reach at least an inside of said drift layer from the surface of said source layer through said well layer;

a buried electrode formed in said trench through a first insulating film;

a control electrode formed on said drift layer, said well layer, and said source layer through a second insulating film;

a first main electrode formed on the second major surface of said semiconductor substrate; and

a second main electrode connected to said source layer and said well layer.

2. A semiconductor element comprising:

a semiconductor substrate of a first conductivity type having a first major surface and a second major

surface opposing the first major surface;

a drift layer of the first conductivity type formed on the first major surface of said semiconductor substrate;

a well layer of a second conductivity type selectively formed in a surface of said drift layer;

a source layer of the first conductivity type selectively formed in a surface of said well layer;

a trench formed to reach at least an inside of said drift layer from the surface of said source layer through said well layer;

a buried electrode formed through a first insulating film in a region extending from said trench of said drift layer to a bottom surface of said trench;

a control electrode formed in a region extending from said source layer to said drift layer through said well layer in said trench to be insulated from said buried electrode through a second insulating film;

a first main electrode formed on the second major surface of said semiconductor substrate; and

a second main electrode connected to said source layer and said well layer.

3. A semiconductor element comprising:

a semiconductor substrate of a first conductivity type having a first major surface and a second major surface opposing the first major surface;

a drift layer of the first conductivity type

formed on the first major surface of said semiconductor substrate;

a trench formed to reach at least an inside of said drift layer from a surface of said drift layer;

a buried electrode formed in said trench through a first insulating film;

a well layer of a second conductivity type selectively formed in a surface of said drift layer between said trenches;

a source layer of the first conductivity type selectively formed in a surface of said well layer;

a control electrode formed on said drift layer, said well layer, and said source layer through a second insulating film;

a first main electrode formed on the second major surface of said semiconductor substrate; and

a second main electrode connected to said source layer and said well layer.

4. A semiconductor element comprising:

a semiconductor substrate of a first conductivity type having a first major surface and a second major surface opposing the first major surface;

a drift layer of the first conductivity type formed on the first major surface of said semiconductor substrate;

a well layer of a second conductivity type selectively formed in a surface of said drift layer;

a first trench formed to reach at least an inside of said drift layer through said well layer;

a buried electrode formed in said first trench through a first insulating film;

a source layer of the first conductivity type selectively formed in a surface of said well layer between said first trenches;

a second trench formed to reach an inside of said drift layer from a surface of said source layer through said well layer;

a control electrode formed in said second trench through a second insulating film;

a first main electrode formed on the second major surface of said semiconductor substrate; and

a second main electrode connected to said source layer and said well layer.

5. An element according to claim 1, wherein said first insulating film has a thickness larger than a value obtained by multiplying a static breakdown voltage of said element by 20Å.

6. An element according to claim 2, wherein said first insulating film has a thickness larger than a value obtained by multiplying a static breakdown voltage of said element by 20Å.

7. An element according to claim 3, wherein said first insulating film has a thickness larger than a value obtained by multiplying a static breakdown

voltage of said element by 20Å.

8. An element according to claim 4, wherein said first insulating film has a thickness larger than a value obtained by multiplying a static breakdown voltage of said element by 20Å.

9. An element according to claim 1, wherein the first insulating film is thicker than the second insulating film.

10. An element according to claim 2, wherein the first insulating film is thicker than the second insulating film.

11. An element according to claim 3, wherein the first insulating film is thicker than the second insulating film.

12. An element according to claim 4, wherein the first insulating film is thicker than the second insulating film.

13. An element according to claim 1, wherein an impurity concentration of said drift layer gradually increases toward said semiconductor substrate.

14. An element according to claim 2, wherein an impurity concentration of said drift layer gradually increases toward said semiconductor substrate.

15. An element according to claim 3, wherein an impurity concentration of said drift layer gradually increases toward said semiconductor substrate.

16. An element according to claim 4, wherein an

impurity concentration of said drift layer gradually increases toward said semiconductor substrate.

17. An element according to claim 1, wherein an impurity concentration of said drift layer is high near a side wall of said trench.

18. An element according to claim 2, wherein an impurity concentration of said drift layer is high near a side wall of said trench.

19. An element according to claim 3, wherein an impurity concentration of said drift layer is high near a side wall of said trench.

20. An element according to claim 4, wherein an impurity concentration of said drift layer is high near side walls of said first and second trenches.

21. An element according to claim 1, wherein said trench takes the form of a stripe.

22. An element according to claim 2, wherein said trench takes the form of a stripe.

23. An element according to claim 3, wherein said trench takes the form of a stripe.

24. An element according to claim 4, wherein each of said first and second trenches takes the form of a stripe.

25. An element according to claim 1, wherein said trench has one of circular, rectangular, and hexagonal shapes.

26. An element according to claim 2, wherein said

trench has one of circular, rectangular, and hexagonal shapes.

27. An element according to claim 3, wherein said trench has one of circular, rectangular, and hexagonal shapes.

28. An element according to claim 4, wherein each of said first and second trenches has one of circular, rectangular, and hexagonal shapes.

29. An element according to claim 1, wherein said buried electrode is electrically connected to said first or second main electrode.

30. An element according to claim 2, wherein said buried electrode is electrically connected to said first or second main electrode.

31. An element according to claim 3, wherein said buried electrode is electrically connected to said first or second main electrode.

32. An element according to claim 4, wherein said buried electrode is electrically connected to said first or second main electrode.

33. An element according to claim 1, wherein said buried electrode is formed by burying a semi-insulating film in said trench through the first insulating film.

34. An element according to claim 2, wherein said buried electrode is formed by burying a semi-insulating film in said trench through the first insulating film.

35. An element according to claim 3, wherein said

buried electrode is formed by burying a semi-insulating film in said trench through the first insulating film.

36. An element according to claim 4, wherein said buried electrode is formed by burying a semi-insulating film in said trench through the first insulating film.

37. An element according to claim 3, wherein said well layer and said source layer are formed to cross said trench in contact with said trench.

38. An element according to claim 3, wherein said well layer and said source layer are formed along said trench.

39. An element according to claim 4, wherein said second trench is formed to be shallower than said first trench.

40. An element according to claim 4, wherein said second trench is formed to cross said first trench, and said source layer is formed in contact with said second trench.

41. An element according to claim 4, wherein said second trench is formed along said first trench, and said source layer is formed in contact with said second trench.

42. An element according to claim 1, wherein said buried electrode set in a floating state.

43. An element according to claim 2, wherein said buried electrode set in a floating state.

44. An element according to claim 3, wherein said

buried electrode set in a floating state.

45. An element according to claim 4, wherein said buried electrode set in a floating state.

46. A semiconductor element comprising:

a semiconductor substrate of a first conductivity type having a first major surface and a second major surface opposing the first major surface;

a drift layer of the first conductivity type formed on the first major surface of said semiconductor substrate;

a well layer of a second conductivity type selectively formed in a surface of said drift layer;

a buried diffusion layer of the second conductivity type formed to reach at least an inside of said drift layer through said well layer;

a source layer of the first conductivity type selectively formed in a surface of said well layer between said buried diffusion layers;

a trench formed to reach an inside of said drift layer from a surface of said source layer through said well layer;

a control electrode formed in said trench through an insulating film;

a first main electrode formed on the second major surface of said semiconductor substrate; and

a second main electrode connected to said source layer and said well layer.

47. A semiconductor element comprising:

a semiconductor substrate of a first conductivity type having a first major surface and a second major surface opposing the first major surface;

a drift layer of the first conductivity type formed on the first major surface of said semiconductor substrate;

a buried diffusion layer of a second conductivity type formed to reach a portion near said semiconductor substrate from a surface of said drift layer;

a well layer of the second conductivity type formed in the surface of said drift layer;

a source layer of the first conductivity type selectively formed in a surface of said well layer between said buried diffusion layers;

a trench formed to reach an inside of said drift layer from a surface of said source layer through said well layer and become shallower than said buried diffusion layer;

a control electrode formed in said trench through an insulating film;

a first main electrode formed on the second major surface of said semiconductor substrate; and

a second main electrode connected to said source layer and said well layer.